

In the claims:

Please amend Claim 5 as in the clean version which follows:

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- 1 5. A disk drive head comprising:
2 a bottom pole;
3 a first insulation layer on said bottom pole;
4 a coil on said first insulation layer;
5 a photoresist insulation layer on said coil;
6 an insulation shell layer on said photoresist insulation layer, said insulation
7 shell layer conforming to the contours of said photoresist insulation layer;
8 a write gap on said insulation shell layer; and
9 a top pole on said write gap layer.
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A marked-up version of the changes made is attached hereto. The attached page is captioned "Version with markings to show changes made."

Comments:

Applicant wishes to thank the Examiner for his detailed comments. As Examiner has grouped his actions by sections, Applicant will respond to these sections one by one.

Elections/Restrictions:

1-2. No response is believed necessary.

Claim objections:

3. Examiner has objected to the informality in Claim 5. This has been corrected in the present amendments above.

Claim Rejections –35USC § 102(b):

4-5. Examiner has rejected Claims 1-8 and 17-19 as being anticipated by *Heim et al.* The rejections are discussed individually and in more detail below and will be answered individually below.

6. Regarding Claim 1, Examiner states that *Heim* shows “a disk drive write head comprising: a bottom pole 152; a write gap layer 76 on said bottom pole 152, a coil 146 on said write gap layer 76, a photoresist insulation layer I2 on said coil 146, an insulation shell layer I3 on said photoresist insulation layer I2; and a top pole 154 on said insulation shell layer I3 on said insulation shell layer I3 (see Figure 13).”

Applicant respectfully asserts that there are several inaccuracies in this statement. In referring to the cited Figure 13 (Prior Art) of *Heim*, in col. 8, lines 46-47, insulation layers I1 142, I2 148, and I3 150 are cited as “The insulation layers 142, 148 and 150 are constructed of hardbaked photoresist.” Thus the prior art cited in Figure 13 of *Heim* does not include an insulation shell, as that term is used in the present application, formed on the photoresist insulation layer. The added layer I3 150 of photoresist material shown here in Figure 13 of *Heim* does not provide the advantages of improved adhesion of magnetic films to the insulation layer, improved grain growth of pole seed layers, decreased differential in thermal mechanical properties between the insulation layer and magnetic film layers, protection of the coil from damage during ion milling processes, and preservation of the desirable magnetic anisotropy properties of high moment magnetic films during fabrication, which are provided by the insulation shell of the present invention.

Looking further at the disclosure in *Heim*, Fig. 4 shows “a coil layer 64 which is sandwiched between first and second insulation layers 66 and 68. A third insulation layer 70 may be employed for planarizing the head to eliminate ripples in the second insulation layer caused by the coil layer.” (col. 5, lines 55-59).

7. Regarding claim 3, examiner states that *Heim* teaches that the insulation shell layer may be formed from a group of dielectric materials in col. 7, lines 5-8.

Again, applicant respectfully points out that this statement is inaccurate. There are significant differences in the structure and materials used in *Heim* and in the present invention. Col. 7, lines 5-7 recite that “The material for the **first insulation layer 66** (emphasis added) may be selected from dielectric materials, such as Al_2O_3 ...” there is however, no recitation in this passage of the material used for the second and third layers. It can be assumed that the I2 layer, from the way it appears to flow and maintain the ripples which follow the contours of the coils 64, is made of photoresist, but for the I3 there is no teaching of the material in that passage.

8. Regarding Claim 4, this claim is dependent on Claim 1, and includes its assertedly novel features by inheritance, and is also assertedly allowable therefore.

9. Regarding Claim 5, Examiner states that *Heim* shows all elements of this claim (bottom pole, first insulation layer, coil, photoresist layer, insulation shell layer, write gap and top pole). However, this figure actually shows bottom pole 152, gap layer 76, first insulation layer 142, coil 146, second insulation layer 148, third insulation layer 150 and top pole 154. The description of this figure in col. 8, lines 46-47, describes all three “insulation layers 142, 148 and 150 are constructed

of hardbaked photoresist.” Thus besides the layer structure being different with regard to the placement of the write gap layer, there is no insulation shell layer as used in the present invention. The structure revealed in this Fig. 13 is much closer to that in Claim 1 of the present application, but still differs because of the lack of an insulation shell layer. Therefore this passage cannot be said to anticipate either Claim 1 and its dependent claims nor Claim 5 and its dependent claims.

10. Regarding Claim 7, as pointed out above, col.7, lines 5-8 of *Heim* say only that the first insulation layer 66 may be of dielectric materials. There is no teaching in this passage that the insulation shell layer may also be of this material.

11-12. Regarding Claims 2, 6, 8, these claims are dependent on Claims 1 or 5 and include their assertedly novel features by inheritance, and are also assertedly allowable therefore.

13. Examiner again cites Figure 13 which supposedly shows an insulation shell layer I3 on a photoresist insulation layer I2, but as discussed above, I3 is also recited as a hardbaked photoresist layer as well, and not an insulation shell layer as discussed with reference to the present application.

14-15. Regarding Claims 18 and 19, these claims are dependent on Claim 17, and include its assertedly novel features by inheritance, and are also assertedly allowable therefore over the passages cited.

Commentary on the Amendments to Claims:

Although not cited in the Office Action by the Examiner, Fig. 7 of *Heim* shows another version of MR head 90 which has an I3 layer 100 on top of an I2 layer, but this I3 layer has a write gap 111 on top of the I3 100 layer. Fig. 22J shows and discusses one step in the method of making the head shown in Fig. 7, and in this discussion, on lines 42-44 of Col. 11, it is disclosed that the third layer 100 of Al₂O₃ or SiO₂ may be sputter deposited on the second insulation layer 99. This third insulation layer 100 is then planarized by lapping leaving a very thin residual layer on the I2 layer 99. The I3 layer 100 is thus used as a filler layer to fill in the gaps and ripples in the I2 photoresist layer as it covers over the coils. Thus it cannot be said to be an insulation shell layer as is recited in Claims 1, 5 or 17.

The insulation shell layer recited in Claim 5 is further distinguished from the I3 layer in *Heim* by conforming to the contours of the photoresist layer beneath it, as the I3 layer in *Heim* does not. It is important that the insulation shell layer conform to the layer beneath, because as the photoresist layer tapers off near the air bearing surface, the insulation shell layer must taper off also so that the pole tips 72, 74 of the first pole piece 60 and the second pole piece 42 are not separated from each other in the vicinity of the write gap 76 (see Fig. 5 of the present application).

Thus Claims 1, 5 and 17 and their dependent claims 2-4, 6-8 and 18-19 all include inventive features not found in the cited references, an Applicant respectfully requests that all rejections be withdrawn and all claims in the case be allowed.